

Section 460

(F) Backfilling

Do not backfill without permission and until the final mop coat thoroughly hardens.
Place backfill so the waterproofing is not damaged.

454-4 METHOD B DAMPPROOFING

(A) General

Method B dampproofing consists of 2 coats of tar, Grade RT 6.

(B) Preparation of Surface

Make sure the surfaces are dry. Immediately before applying the first dampproofing coat, thoroughly clean the surfaces of dust and loose materials. Permit the concrete to cure for at least 14 days for Class A concrete, at least 10 days for Class AA concrete or 7 days for high early strength concrete before dampproofing.

(C) Application

Give the concrete surfaces 2 applications tar, Grade RT 6. Apply the tar with suitable brushes to secure uniform and thorough applications. Do not apply the second coat of tar until the first coat thoroughly sets. Do not apply dampproofing during any time that the surface is exposed to any moisture. Make sure that the temperature of the tar is such that uniform and thorough application is obtained. Do not backfill until the second coat thoroughly sets.

454-5 MEASUREMENT AND PAYMENT

Method A Waterproofing will be measured and paid as the actual number of square yards of surface that is waterproofed. In measuring this quantity, measurement is made along the actual surface that is to be waterproofed before the waterproofing is applied.

Method B Dampproofing will be measured and paid as the actual number of square yards of surface that is dampproofed. In measuring this quantity, measurement is made along the actual surface that is to be dampproofed before the dampproofing is applied.

These prices and payments will be full compensation for all items required to waterproof and dampproof including, but not limited to, those items contained in Article 454-1.

Payment will be made under:

Pay Item	Pay Unit
Method A Waterproofing	Square Yard
Method B Dampproofing	Square Yard

SECTION 460 BRIDGE RAILING

460-1 DESCRIPTION

Furnish and place metal, pipe or concrete barrier bridge railing in accordance with these specifications and as shown in the plans. Furnish posts, rail bars, pipe fittings, hardware, paint, barrier delineators, concrete, reinforcing steel, admixtures, forms, falsework and all other materials; galvanize; paint; fabricate and erect rail; and place, finish and cure concrete.

460-2 MATERIALS

Refer to Division 10.

Item	Section
Aluminum Rail	1074-5
Barrier Delineators	1088-2
Epoxy Coated Reinforcing Steel	1070-7

Item	Section
Galvanized Steel Rail	1074-5
Paint	1080
Pipe Rail	1074-6
Portland Cement Concrete	1000
Steel Bar Reinforcement	1070-2

1 **460-3 CONSTRUCTION METHODS**

2 Adhere to the construction load limitations of Article 420-20 while placing concrete for all
3 bridge rails.

4 **(A) Metal Rail**

5 Use either aluminum or galvanized steel rail, but use the same material on all structures
6 on the project on which metal rail is required.

7 Use shims if necessary to obtain correct post alignment.

8 Drive aluminum rivets cold. Thoroughly coat the base of aluminum rail post, closure
9 plates, shims or any other aluminum surface in contact with concrete with an approved
10 aluminum impregnated caulking compound.

11 **(B) Pipe Rail**

12 Give galvanized pipe rail one field coat of organic zinc repair paint, of minimum wet
13 thickness of 1.5 mils, after erection in accordance with Section 442 unless otherwise
14 required in the contract.

15 **(C) Concrete Barrier**

16 This subarticle applies to the construction of concrete barrier rail, vertical concrete barrier
17 rail, median barrier rail and concrete parapet, referred to collectively as concrete barrier
18 rail.

19 Plans for the concrete barrier rail are detailed for slip-formed cast-in-place concrete.
20 Unless otherwise noted, construct concrete barrier rail detailed in the plans using
21 conventional forms or by slip-forming using an approved self-propelled extrusion
22 machine. Except as noted herein, construct in accordance with Section 420.

23 Construct joints in the barrier rails at the locations and of the type shown in the plans.

24 Construct concrete barrier rail to the shape, line, grade and dimensions shown in the plans
25 except that when slip-forming rails, either radius or chamfer the corners. Check slip-
26 formed rail concrete directly behind the extrusion machine using successive overlapping
27 applications of the 10 ft straightedge. Correct high and low areas while the concrete is
28 still workable. Limit horizontal and vertical deviation from plan line and grade to no
29 more than 1/4" in 10 ft.

30 Provide sufficient internal vibrators to consolidate the concrete along the faces of forms
31 and adjacent to joints. Consolidate the concrete by internal vibration in one pass of the
32 extrusion machine. Produce a dense and homogeneous barrier free of voids and
33 honeycomb with minimum hand finishing. Coordinate concrete delivery and placement
34 to provide uniform progress while minimizing stopping and starting of the extrusion
35 machine.

36 When plans require horizontal deck drains through the barrier rails, use drain couplings
37 with slip-formed rails.

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Correct all exposed surfaces that are not satisfactory to the Engineer as to uniformity of color and texture or because of excessive patching as required. Give the roadway face of barrier rails constructed using conventional forms a Class 2 surface finish in accordance with Subarticle 420-17(F). Use a broom finish on the roadway face of slip-formed barrier rails.

Provide barrier rail delineators in accordance with Section 854.

460-4 MEASUREMENT AND PAYMENT

____ *Bar Metal Rail* will be measured and paid as the actual number of linear feet of metal rail, measured along the top bar of the rail, that is completed and accepted.

____" *Galvanized Steel Pipe Rail* will be measured and paid as the actual number of linear feet of pipe rail, measured along the top pipe of the installed pipe rail, that is completed and accepted.

Concrete Barrier Rail will be measured and paid as the number of linear feet of concrete barrier rail provided in the plans.

Vertical Concrete Barrier Rail will be measured and paid as the number of linear feet of vertical concrete barrier rail provided in the plans.

Concrete Median Barrier will be measured and paid as the number of linear feet provided in the plans.

____ x ____ *Concrete Parapet* will be measured and paid as the number of linear feet of concrete parapet provided in the plans.

There will be no direct payment for bridge rail delineators as they are incidental to the work being performed.

These prices and payments will be full compensation for all items required to provide bridge railing including, but not limited to, those items contained in Article 460-1.

Payment will be made under:

Pay Item

____ Bar Metal Rail
____" Galvanized Steel Pipe Rail
Concrete Barrier Rail
Vertical Concrete Barrier Rail
Concrete Median Barrier
____ x ____ Concrete Parapet

Pay Unit

Linear Foot
Linear Foot
Linear Foot
Linear Foot
Linear Foot
Linear Foot

SECTION 462 SLOPE PROTECTION

462-1 DESCRIPTION

Construct slope protection under the ends of bridges or at other locations in accordance with details shown in the contract. Excavate and backfill, furnish and place concrete, reinforcement and other materials. Unless otherwise noted in the plans, use cast-in-place reinforced concrete.

462-2 MATERIALS

Refer to Division 10.

Item

Curing Agents
Joint Fillers
Portland Cement Concrete

Section

1026
1028-1
1000